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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,350	12/14/2001	Glenn A. Rinne	9180-10	6825

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EXAMINER
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STONER, KILEY SHAWN

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 05/27/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/017,350

Applicant(s)

RINNE ET AL.

Examiner

Kiley Stoner

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1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 4-10-03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-67 is/are pending in the application.
- 4a) Of the above claim(s) 2-5 and 18-67 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,6-9,11 and 17 is/are rejected.
- 7) ☒ Claim(s) 10 and 12-16 is/are objected to.
- 8) ☒ Claim(s) 1-67 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 184.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of Group I, Species Ie (claims 1 and 6-17) in Paper No. 6 is acknowledged.

### ***Claim Objections***

Claim 9 is objected to because of the following informalities: In claim 9, line 2 the term "relatively" is indefinite because it is unclear as to what constitutes a "relatively high diffusion rate". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 6-9, 11 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Ecer (5,812,925). Ecer teaches positioning the components relative to one another to obtain a desired orientation; and bonding the two components in the desired orientation with metal wherein a temperature of both components is maintained below a melting temperature of the metal while bonding (abstract; column 2, line 48-column 3, line 21; column 3, line 57-column 4, line 5; column 5, lines 7-18; column 5,

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line 51-column 6, line 12; and claims 1 and 8). Diffusion bonding is a solid-state process in which the layers do not melt. Since the particle layer of Ecer does not melt, the temperature of both components is maintained below the melting temperature of the metal. If the temperature of the components exceeded the melting temperature of the metal, the metal would inherently melt. Ecer also teaches providing particles of the metal on the two components and bonding the metal particles (abstract; column 2, line 48-column 3, line 21; column 3, line 57-column 4, line 5; column 5, lines 7-18; column 5, line 51-column 6, line 12; and claims 1 and 8); each of the particles of the metal comprises a dielectric material coated with the metal (column 5, lines 51-64); allowing diffusion between the metal particles (abstract; column 2, line 48-column 3, line 21; column 3, line 57-column 4, line 5; column 5, lines 7-18; column 5, line 51-column 6, line 12; and claims 1 and 8); providing the particles of the metal with a dielectric coating thereon and wherein bonding the metal particles is preceded by rupturing the dielectric coatings; and providing the particles of the metal with a diffusion barrier thereon and wherein bonding the metal particles is preceded by rupturing the diffusion barrier (column 5, lines 51-64). Oxides have been defined as being a dielectric and a barrier layer in the applicant's disclosure. In addition, the Examiner's considers the materials of Ecer to have a high diffusion rate at room temperature.

***Allowable Subject Matter***

Claims 10 and 12-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: The prior art of record does not teach either alone or in combination a method of bonding two components as recited by claim 10, particularly bonding the two components in the desired orientation with Indium metal wherein the temperature of both components is maintained below the melting temperature of the metal while bonding; or a method of bonding two components as recited by claim 12, particularly rupturing the dielectric coatings by passing the electric current through the particles; or a method of bonding two components as recited by claim 13, particularly, the metal comprises the first metal with the first rate of diffusion and wherein the particles comprise the coating of the second metal with the second rate of diffusion wherein the second rate of diffusion is lower than the first rate of diffusion; or a method of bonding two components as recited by claim 14, particularly the first metal comprises Indium and the second metal comprises Copper, wherein the temperature of both components is maintained below the melting temperature of the metal while bonding; or a method of bonding two components as recited by claim 15, particularly providing the particles of the metal with the coating of the solid material that sublimates at the bonding temperature less than the melting temperature of the metal; or a method of bonding two components as recited by claim 16, particularly the solid material comprises one of naphthalene or carbon dioxide.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

The prior art of record that is cited as of interest is presented on the form-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiley Stoner whose telephone number is (703) 305-0723. The examiner can normally be reached on Monday-Thursday (7:30 a.m. to 6:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on Monday-Friday. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Kiley Stoner A.U. 1725

 5-21-03